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(19)(CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Tubular Filtering Apparatus and Method of Manufacturing the Same

(72) Potter, Jimmy Nelson - Canada ;

(71) Same as inventor

(57) 2 Claims

ABSTRACT OF THE DISCLOSURE

Tubular filtering apparatus and a method of manufacturing the same. Firstly, providing at least two pipes of differing diameters which are capable of co-axial telescopic nesting. Secondly, cutting a plurality of apertures in each of the pipes. Thirdly, nesting the pipes telescopically with the apertures in the respective pipes partially out of alignment to create a plurality of resultant apertures that are smaller than the apertures in any one of the pipes. Fourthly, securing the pipes against relative movement. This method was developed to enable a tubular filtering apparatus to be fabricated using existing cutting equipment with apertures as small as two thousandths of an inch.

TITLE OF THE INVENTION:

tubular filtering apparatus and method of manufacturing the same.

NAME OF INVENTOR:

Jimmy Nelson Potter

FIELD OF THE INVENTION

The present invention relates to a tubular filtering apparatus and a method of manufacturing the same. In particular, a tubular filtering apparatus used to prevent particulate matter from contaminating liquids entering into a well bore.

BACKGROUND OF THE INVENTION

Slotted pipe is used in well bores as a form of filtering apparatus. Fluids, such as oil, gas, water, and the like, can readily flow through slotted apertures in the pipe, while particulate matter larger than the width of the slots is precluded from entry. Users of slotted pipe are requesting smaller slots in order to reduce the amount of particulate matter in the fluids recovered. However, the equipment used for cutting slots in pipe are not suited for cutting slots smaller than 12,000 on an inch in width. The reason for this is that the width of the slot is tied to the width of the cutting blade used. In order to cut slots that are smaller than 12,000 of an inch, thin blades must be used that are fragile and, as such, prone to breakage.

SUMMARY OF THE INVENTION

What is required is a method of manufacturing tubular filtering apparatus which better suited to making apertures smaller than 12,000 of an inch.

According to one aspect of the present invention there is provided a method of manufacturing a tubular filtering apparatus. Firstly, providing at least two pipes of differing diameters which are capable of co-axial telescopic nesting. Secondly, cutting a plurality of apertures in each of the at least two pipes. Thirdly, nesting the at least two pipes telescopically with the apertures in the respective pipes partially out of alignment to create a plurality of resultant apertures that are smaller than the apertures in any one of the at least two pipes. Fourthly, securing the at least two pipes against relative movement.

According to another aspect of the present invention there is provided a tubular filtering apparatus which includes at least two co-axial telescopic nesting pipes both having a plurality of apertures. The at least two pipes are secured together with their apertures partially out of alignment. This creates a plurality of resultant apertures that are smaller than the apertures in any one of the at least two pipes.

A tubular filtering apparatus constructed in accordance with the teachings of the described method can readily provide an aperture size that is smaller than 12,000 of an inch. Beneficial results have been obtained with aperture sizes in the range of 2000 to 7000 thousandths of an inch.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more apparent from the following description in which reference is

made to the appended drawings, wherein:

FIGURE 1 is an end view, in section, of a first embodiment of tubular filtering apparatus constructed in accordance with the teachings of the present invention.

FIGURE 2 is a side elevation view of the first embodiment of tubular filtering apparatus illustrated in **FIGURE 1.**

FIGURE 3 is a perspective view of the first embodiment of tubular filtering apparatus illustrated in **FIGURE 1.**

FIGURE 4 is an end view, in section, of a second embodiment of tubular filtering apparatus constructed in accordance with the teachings of the present invention.

FIGURE 5 is a side elevation view of the second embodiment of tubular filtering apparatus illustrated in **FIGURE 4.**

FIGURE 6 is a perspective view of the second embodiment of tubular filtering apparatus illustrated in **FIGURE 4.**

FIGURE 7 is an end view, in section, of a third embodiment of tubular filtering apparatus constructed in accordance with the teachings of the present invention.

FIGURE 8 is a side elevation view of the third embodiment of tubular filtering apparatus illustrated in **FIGURE 7.**

FIGURE 9 is a perspective view of the third embodiment of tubular filtering apparatus illustrated in **FIGURE 7.**

FIGURE 10 is a perspective view of a fourth embodiment of tubular filtering apparatus constructed in accordance with the teachings of the present invention.

FIGURE 11 is an end view, in section, of the fourth embodiment of tubular filtering apparatus illustrated in **FIGURE 10.**

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred method of manufacturing a tubular filtering apparatus will now be described with reference to **FIGURES 1** through **11.**

The method includes the following steps. Firstly, referring to **FIGURES 1** through **3**, providing at least two pipes 12 and 14. Pipes 12 and 14 are differing diameters and are capable of co-axial telescopic nesting. Secondly, cutting a plurality of apertures 16 and 18, in each of pipes 12 and 14, respectively. In this embodiment apertures 16 and 18 are in the form of longitudinal slots. Thirdly, nesting pipes 12 and 14 telescopically with apertures 16 and 18 in respective pipes 12 and 14 partially out of alignment to create a plurality of resultant apertures 20 that are smaller than either of apertures 16 or 18. Fourthly, securing pipes 12 and 14 against relative movement. This final step is intended to ensure that the size of resultant apertures 20 does not vary as a results of relative rotation of pipes 12 and 14 during use. The preferred manner of securing pipes 12 and 14 against relative movement is by welding.

In order that the full scope of this invention will be appreciated a variety of embodiments will now be described, all of which follow the teachings of the above described method.

First embodiment, generally identified by reference numeral 22 is illustrated in **FIGURES 1** through **3**. In first embodiment 22, apertures 16 and 18 are in the form of elongate slots. An adjustment of the size of resultant apertures 20 is preferably made by relative rotation of pipe 12 and pipe 14, as indicated by arrow 24.

Second embodiment, generally identified by reference numeral 26 is illustrated in **FIGURES 4** through **6**. In second embodiment 26, apertures 16 and 18 are in the form of transverse slots. An adjustment of the size of resultant apertures 20 is preferably made by relative axial movement of pipe 12 and pipe 14, as indicated by arrow 28.

Third embodiment, generally identified by reference numeral 30 is illustrated in **FIGURES 7** through **9**. In third

embodiment 30, apertures 16 and 18 are in the form of round holes. An adjustment of the size of resultant apertures 20 is preferably made by relative axial movement of pipe 12 and pipe 14, as indicated by arrow 32.

Fourth embodiment, generally identified by reference numeral 34 is illustrated in **FIGURES 10** and **11**. Apertures 16 and 18 are in the form of elongate slots, as was the case with first embodiment 22. Unlike first embodiment 22, fourth embodiment 34 uses a third pipe 36, which also has a plurality of apertures 38. Resultant apertures 20 are, therefore, the product of apertures 16, 18 and 38. An adjustment of the size of resultant apertures 20 is preferably made by relative rotation of pipes 12, 14, and 36, as indicated by arrow 40.

Each of the described embodiments of tubular filtering apparatus have at least two co-axial telescopic nesting pipes 12, 14 and 36 each of which has a plurality of apertures 16, 18 and 38, respectively. The at least two pipes 12, 14 and 36 are secured together with their apertures 16, 18 and 38 partially out of alignment. This creates a plurality of resultant apertures 20 that are smaller than the apertures 16 or 18 or 38 in any one of the at least two pipes 12, 14, or 36.

Although the teachings of this invention were developed in order to make tubular filtering apparatus with openings small than 12,000 of an inch, it will be apparent to one skilled in the art that these same teachings can also be used to make tubular filtering apparatus with openings greater than 12,000 of an inch. It will also be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A method of manufacturing a tubular filtering apparatus, comprising the steps of:

firstly, providing at least two pipes of differing diameters which are capable of co-axial telescopic nesting;

secondly, cutting a plurality of apertures in each of the at least two pipes;

thirdly, nesting the at least two pipes telescopically with the apertures in the respective pipes partially out of alignment, thereby creating a plurality of resultant apertures that are smaller than the apertures in any one of the at least two pipes; and

fourthly, securing the at least two pipes against relative movement.

2. A tubular filtering apparatus, comprising:

at least two co-axial telescopic nesting pipes both having a plurality of apertures, the at least two pipes being secured together with their apertures partially out of alignment, thereby creating a plurality of resultant apertures that are smaller than the apertures in any one of the at least two pipes.

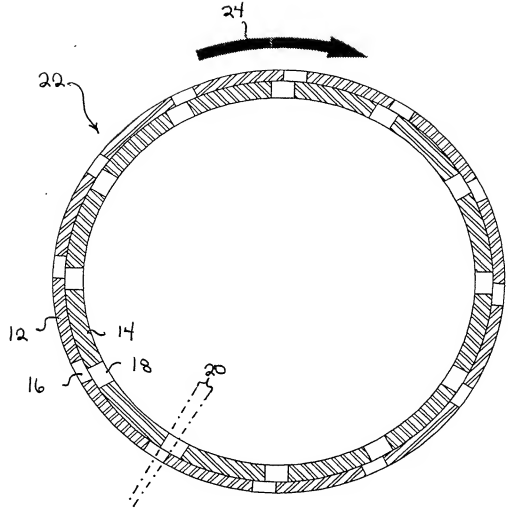

FIGURE 1

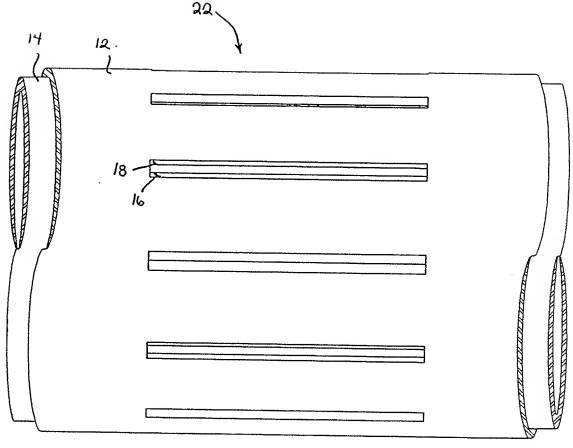

FIGURE 2

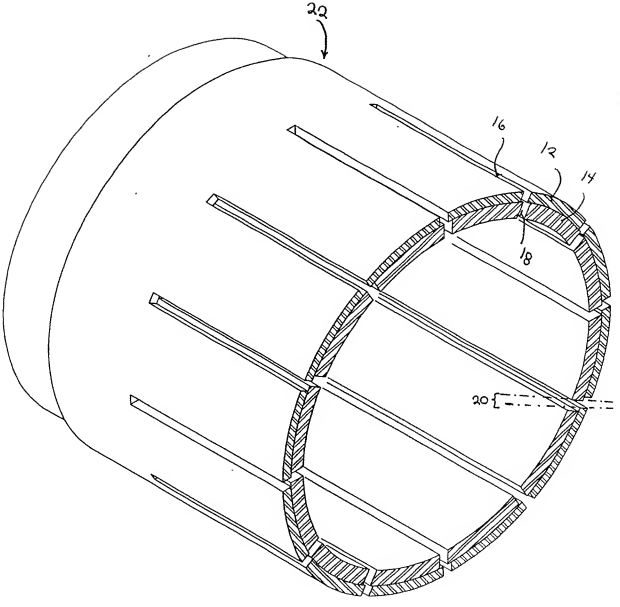

FIGURE 3

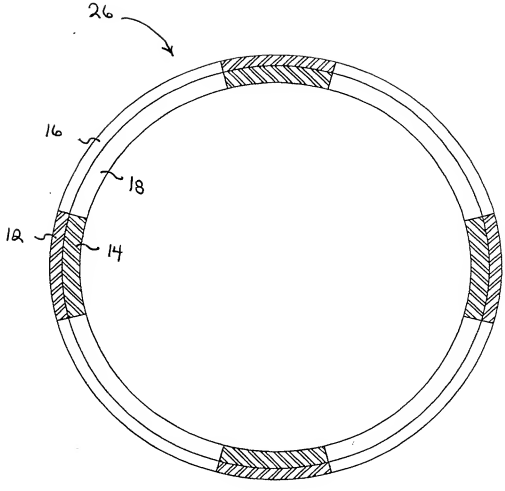

FIGURE 4

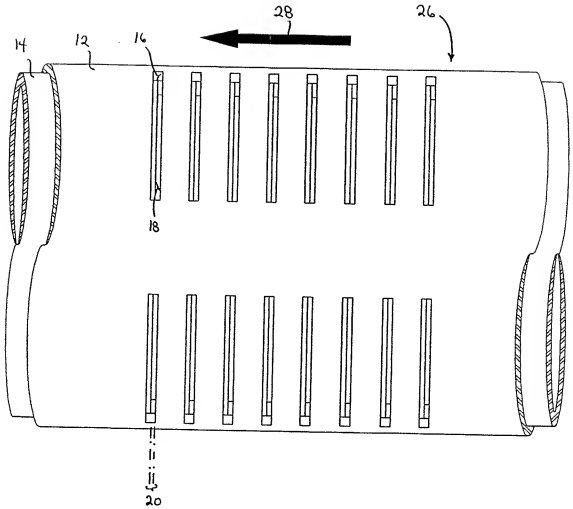

FIGURE 5

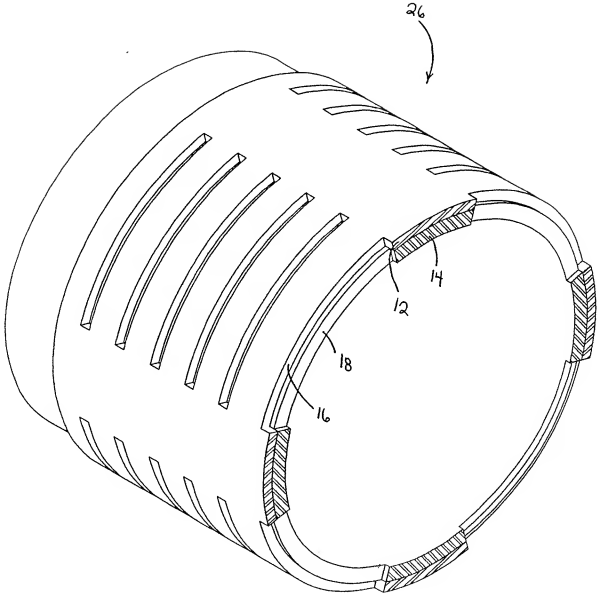

FIGURE 6

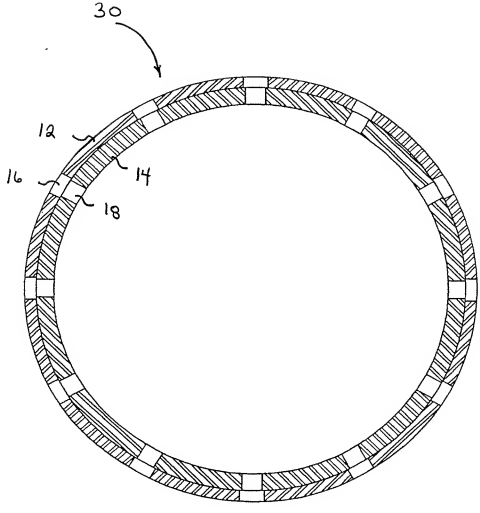

FIGURE 7

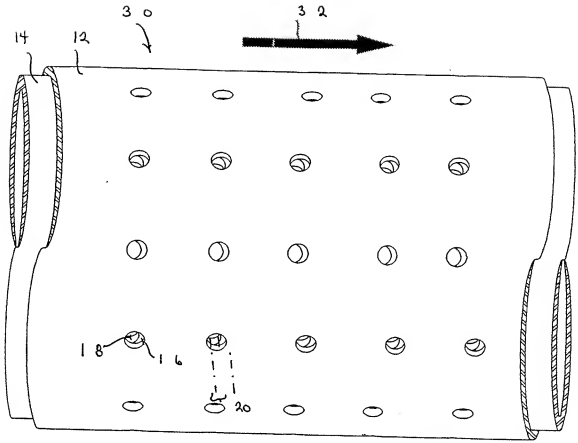

FIGURE 8

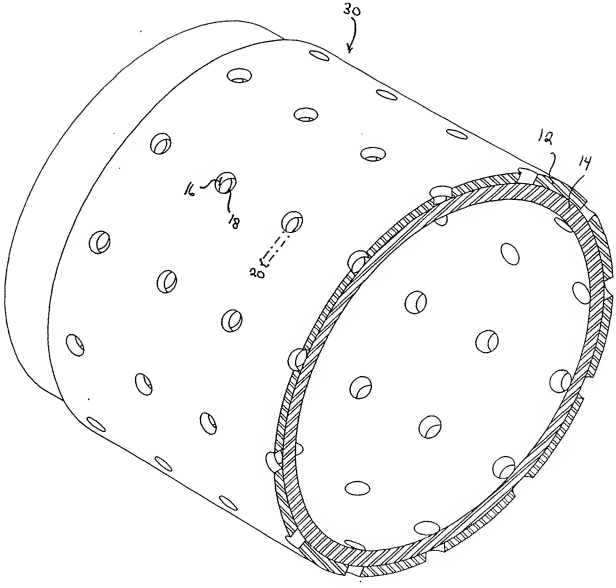

FIGURE 9

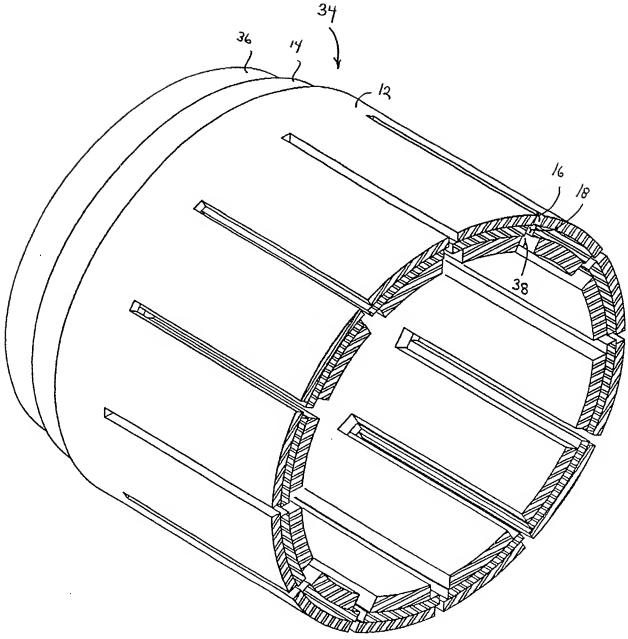

FIGURE 10

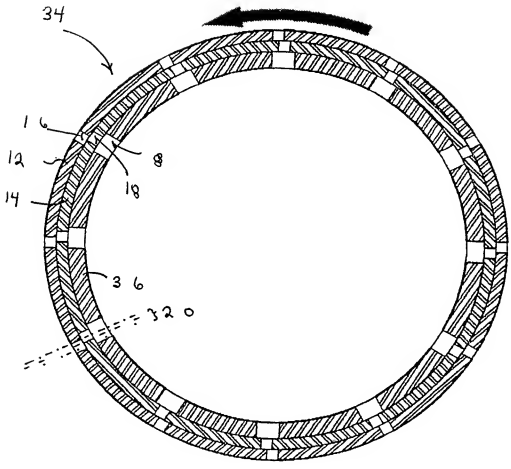

FIGURE 11